HYGIENE AND PUBLIC HEALTH.

UNDER THE CHARGE OF
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Botulism from Fish.—DR. R. DAVID (*Deutsche medicinische Wochenschrift*, 1899, No. 8) reports in detail five interesting cases of poisoning due to stale fish. The cases are remarkable for the variety of manifestations, the length of time that elapsed before the appearance of the symptoms, and, in two of them, the severity and duration of the illness. The afflicted persons, adult members of one family, ate on March 19, 1898, some raw red herrings, which gave off odor indicative of commencing putrefaction. Each ate the same amount, a whole fish; but whether each fish was equally advanced in decomposition cannot, of course, be determined, and the differing degrees of severity of effects may be explained by unequal susceptibility. The father and mother, aged, respectively, sixty-five and sixty-seven years, suffered least; the son, aged thirty-one years, was affected more seriously; the two daughters presented unusually severe and complicated symptoms.

The first effects were manifested by the son, who, on the second day, was seized with loss of appetite, disagreeable eructations, vomiting, diarrhœa, dryness of the throat, and general weakness. On the following day he was better, but soon became worse. Diarrhœa was followed by obstinate constipation, which finally yielded with difficulty to cathartics. Five days later he had dimness of sight, which was followed after a week by double vision and difficult deglutition. The symptoms gradually abated, and on May 27th there was distinct improvement of sight. On June 2d glasses were hardly needed.

The mother first showed symptoms on the fifth day, when nausea, constipation, and dryness of the throat appeared. Several days later she had double vision and difficult deglutition. The father's case began on the ninth day, and presented similar symptoms, which disappeared in six weeks. One of the daughters was seized on the third day with bad taste in the mouth, constipation, and dryness of the throat, followed in six days by dimness of near vision, then by double vision, paralysis of accommodation, and difficult swallowing. As was the case with the others, the temperature, circulation, and urine remained normal. On May 2d there was complete inability to swallow, and it was necessary to introduce food by means of a stomach-tube. There was slight ptosis of the right eye, then of both; the voice was nasal, the gait was affected, and the pulse became very small, though not very rapid. On May 9th bladder symptoms, which had been gradually appearing, culminated in paralysis of that organ, and after the 13th there came a variety of bladder and abdominal symptoms. In the first part of July she felt completely well, but a month later (August) she suffered a slight relapse, with reappearance of constipation, difficult deglutition, and disturbance of vision, which persisted to some extent into September. Complete recovery did not occur until October, almost seven months after the disturbance began. The other daughter showed the first symptoms after the lapse of a week. These were in the main like those of her sister, but were more severe and extensive. She began to improve in May, and then ensued alternate improvement and loss of ground, better one day and worse the next. On the 15th there was pain in the left hypochondrium; on the 17th an eruption like that of scarlet fever over the whole body, with albuminuria, but no casts. On the 19th severe pain in the left hypochondrium, less in the right, and tenderness in the region of the kidneys, with epistaxis, disappearance of the rash, slight desquamation, and improved vision. At the end of May the albuminuria and pain in the region of the kidneys had nearly disappeared, and deglutition was perfect. On June 2d heart complications appeared, which persisted into November, when hypertrophy was established. In August, after a general improvement, there was a relapse like that which occurred in the case of her sister. Improvement was well established in October, and in November she had almost wholly recovered.

It was unfortunately impossible to make a bacteriological and chemical examination of the fish, because no material was obtainable.

[Had it been possible to make an investigation of the food material in this case it seems most probable, from the great similarity of the symptoms to those reported by Van Ermengen, due to eating infected raw ham (see this JOURNAL, July, 1898) that the same organism, *bacillus botulinus*, would have been found to be the cause of the trouble. The longer period of incubation in these cases is perhaps the most striking difference.—C. H.]

A New Method of Estimating Moisture in Walls.—DR. G. MARKL (*Archiv für Hygiene*, xxxiv. Heft 1) has devised a new scheme for determining moisture in mortar and plastered walls which seems likely to supersede entirely the methods heretofore in use, which, on one account and another, do not generally commend themselves, although they yield accurate results. His process is based on the fact that alcohol changes its specific gravity as it absorbs water. It is quickly carried out, requires no elaborate apparatus, and yields sufficiently accurate results. From 10 to 50 grammes of plaster are treated in a dry flask with 150 c.c. of strong alcohol of known specific gravity. The mixture is well shaken, filtered quickly through a dry filter, and then the rise in the specific gravity of the alcohol, due to the absorption of water, is determined. This is easily translated into percentage of water taken up. A series of comparison tests and analyses showed but a very slight difference in results, the differences being due to solution of minute amounts of the constituents of the material, as lime, common salt, nitrates of calcium and sodium, chloride of calcium, and others, but the amounts taken up in the alcohol are so slight as to be unworthy of notice.

The Germicidal Value of Proprietary Disinfectants.—DRS. HARRINGTON and R. M. PEARCE (*Journal of the Boston Society of Medical Sciences*, March,

1899) have made chemical analyses of a dozen of the popular proprietary disinfectants recommended for use in the sick-room, and have determined their germicidal value in the treatment of typhoid stools, tuberculous sputum, and diphtheria membrane. The materials treated were exposed uniformly to the action of the several disinfectants for two hours. Cultures were then made in fresh bouillon, and at the expiration of forty-eight hours the result, growth or no growth, was noted. In the case of sputum the process was different; the sputum which had been supposably disinfected was inoculated into the subcutaneous tissue of guinea-pigs, which, unless they died sooner, were killed at the end of six weeks. A control animal killed after five weeks showed typical tuberculous lesions.

The bacteriological tests showed that not one of the agents most commonly sold can be regarded as a safe and trustworthy disinfectant. Each one was given ten separate tests. Three of them proved to be absolutely inert, and the others gave from 30 to 90 per cent. of unsuccessful results. The results were far from uniform in repeated experiments with the same agent; thus, it might sterilize one typhoid stool and show no result with another. Only one of the entire twelve succeeded in sterilizing sputum, and that one is not sold as a general disinfectant, but as an "air purifier." Carbolic acid, 5 per cent.; formaldehyde, 1 per cent., and a 5 per cent. solution of a preparation containing cresols were also tried on the same objects. The carbolic acid was successful in only two out of six trials, one of the two being with sputum. The other two killed the organisms in every case.

Chemical analysis showed that the ingredients used are such as have a reputation as disinfectants, and that the preparations are not intentional frauds. The commonest ingredients were chloride and sulphate of aluminium, chlorides of zinc, magnesium, sodium, and potassium. Two contained copper, one lead, and one iron salts. One was wholly chloride of zinc, another was a plain solution of permanganate of potassium, another was a fairly strong preparation of chlorinated soda, and three were strong smelling preparations containing neutral tar oils.

The proprietary disinfectants are not only unreliable, but are expensive, enormously so in comparison with the simple and effective 1 per cent. solution of formaldehyde.

Life-duration of Pathogenic Bacteria.—PROFESSOR A. GAERTNER (*Zeitschrift für Hygiene und Infectionskrankheiten*, xxviii. Heft 1) has made an investigation of the influence of manure and compost on the life of pathogenic bacteria, with special reference to the disinfecting action of the rise in temperature, which under favorable conditions is considerable, the action of other bacteria present, chemical changes, lack of oxygen, and excess of carbon dioxide. In order to approximate natural conditions he made beds of horse-dung and cow-dung, with and without straw, garden soil, fecal and peaty matters, and buried in them, in wire baskets at varying depths, bacterial cultures, including cholera, typhoid, tuberculosis, chicken-cholera, and swine-erysipelas, mixed with human and animal feces. The beds began to heat very soon, and by the seventh day reached 70° C. in September, and 47.5° C. in October, and slowly cooled. In the beds made with human feces and earth the temperature never went above 30° C., and usually ran lower.

In winter there was no very marked rise, and in February it did not exceed 5.5° C. The organisms were destroyed the more quickly the higher the rise in temperature; but other factors, such as lack of oxygen, accumulation of carbon dioxide, etc., come into play. In summer they die more quickly than in winter; they may live months in cold weather. Typhoid and cholera were the least resistant of those tried; swine-erysipelas lasted twice as long, and chicken-cholera and tuberculosis were found to be virulent after months of exposure.

DR. MARTIN FICKER (*Ibid.*, xxix. Heft 1) reports the results of a research on the influence of dryness, moisture, heat and cold, and other conditions on the life of the organisms of cholera, typhoid, diphtheria, and plague. The experiments were conducted with observance of the greatest care to secure agreement of conditions in all respects as to age and source of cultures, culture media, etc. Silk threads, dust, and other matters with varying physical and chemical properties were avoided, and the organisms were handled all in the same way on cover-glasses of one quality. They died more quickly when exposed in thin layers, and in thicker layers they retained their vitality longer in the desiccator than when exposed outside. Air in motion is more inimical to them than in a state of rest. The older the culture, other things being equal, the quicker it dies; the more virulent it is, the longer it resists. Alternation of dryness and moisture hastens the death of all four kinds in an extraordinary degree. In moist atmospheres life is retained longer with low temperatures, and old cultures live longer than new ones. In dry air the older cultures succumb earliest. In a moist atmosphere cultures of cholera one day old died in one to one and one-fifth days, while cultures five days old lasted from thirteen to sixteen days. The composition of the fluids in which the bacteria are has a material influence, and the thicker the sowing the longer the life-period. Old cultures show generally less resistance to heat than younger ones, but greater virulence is accompanied by greater resistance.

Leprosy in the United States.—In the report accompanying Senate bill 2904, providing for the investigation of leprosy in the United States (*Public Health Reports*, March 10, 1899) appears a letter from the Supervising Surgeon-General of the Marine-hospital Service suggesting the probability that there are many more cases of leprosy in the country than have been recorded. No systematic inquiry has been made with regard to the origin and prevalence of the disease. Recent investigation and study have demonstrated that quite a number of obscure forms of nervous and skin diseases are nothing more or less than leprosy.

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